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International Application No.: PCT/EP03/05812  
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Preliminary Amendment Accompanying  
Substitute Specification

**Amendments to the Drawings:**

The attached sheet of drawings includes changes to Figures 3a-3d. This sheet replaces the original sheet including Figures 3a-3e.

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REMARKS

Figures 3a-3d have been amended to change the reference numeral associated with the cover 6 and one Replacement Sheet containing Figures 3a-3e is presented herewith for approval.

The substitute specification enclosed herein contains no new matter.

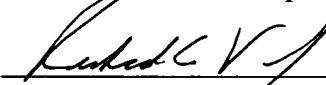
Claims 1-18 are pending, claims 1-5 are currently amended, and claims 6-18 are new.

The Director is authorized to charge any additional fees due by way of this Amendment, or credit any overpayment, to our Deposit Account No. 19-1090.

All of the claims remaining in the application are now clearly allowable. Favorable consideration and a Notice of Allowance are earnestly solicited.

Respectfully submitted,

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Enclosures:

Postcard  
1 Replacement Sheet of Drawings – Figures 3a-3e  
Redlined Substitute Specification  
Substitute Specification

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## HAZARD NAVIGATION LIGHT FOR WIND POWER INSTALLATION TURBINES

### BACKGROUND OF THE INVENTION

#### 5 Field of the Invention

The invention concerns a wind power installation.

#### Description of the Related Art

Such wind-Wind power installations have long been known. They usually consist of a number of components such as a pylon and a machine housing which is mounted thereon and which accommodates the rotor of the wind power installation and the generator connected thereto for producing energy. Whenever such wind power installations are located within air traffic zones, that is to say those regions which are directly in the relative proximity of airports, such wind power installations must be provided with certain signalling devices so that the attention of the air traffic is drawn to the existence of the wind power installation as a large structure, in good time.

Signalling devices can also be coats of paint on the rotor blades (in particular the tips thereof) of the wind power installation.

General guidelines for identifying obstacles to air travel are known from 'Nachrichten für Luftfahrer' ['News for Pilots'], Part I, NfL I 15/00, 27th January 2000.

The various flight lighting arrangements are also mentioned therein. Another flight lighting arrangement is known from DE-U-200 08 289.

### BRIEF SUMMARY OF THE INVENTION

25 In one aspect, embodiments The object of the invention is to eliminate the previous disadvantages of flight lighting arrangements.

~~That object is be attained in a wind power installation having the features set forth in claim 1. Advantageous developments are described in the appendant claims.~~

~~In the wind power installation having one embodiment of a flight~~

- ~~5 lighting arrangement is, provided below the a flashing signalling device is with a cover which prevents the flashing signaling device from being visible in a given cone (viewed from the flight lighting arrangement) laterally of the wind power installation as seen from the ground. The cone is preferably of a width opposing sides of the cone can be separated by an angle of at least 45°, but preferably 90° -~~
- ~~10 150°, or thereabove to over even equal or greater than 180° (horizontal). Such a cover admittedly prevents a view on to of the flight lighting arrangement at an angle below the when the flight lighting arrangement is viewed from within a region defined by the cone around the wind power installation, but normal air traffic is may still in a position to recogniserecognize the light of the flight lighting arrangement~~
- ~~15 from a distance.~~

~~If in addition In one embodiment, the cover is a mirrored surface and in particular also is of with a parabolic configuration; that causes the flashing signal to appear in strengthened form and more easily visible to the air traffic.~~

~~The device according to the inventionIn another aspect, an~~

- ~~20 embodiment, provides an advantage in that the flight lighting arrangement is no longer experienced as being annoying even right in the region of residences and can substantially reduce the light pollution for the a residential population is avoidedin the region around the wind power installation.~~

- ~~25 an angle of 150° or more already means can mean that, as viewed from the ground, the light of from the flight lighting arrangement is no longer to be is not seen; at a distance of 0 to 2000 m, preferably only at least up to 1000 m, from the region around wind power installation. This means that in particular the light of~~

~~from the flight lighting arrangement is~~~~may~~ no longer experienced as being ~~be~~ a burden in adjoining or nearby residential areas.

The invention is described in greater detail hereinafter by means of ~~an~~several embodiment.

## 5 BRIEF DESCRIPTION OF THE DRAWINGS

In the drawings:

Figure 1 shows a plan view of a wind power installation according to one embodiment of the invention,

Figure 2 shows a side view of a wind power installation according to one embodiment of the invention, and

Figures 3a, b, c, d and e show various embodiments of a wind power installation according to the invention.

## DETAILED DESCRIPTION OF THE INVENTION

Figure 1 shows a plan view of a wind power installation 1 comprising a pylon and a machine housing 2 mounted thereon as well as the rotor 3 of the wind power installation and the machine housing casing (pod) 4. As can be seen in Figure 2 provided on the pod is a flight lighting arrangement 5 which is caused to flash from time to time or constantly by a suitable control (not shown). Provided below the flight lighting arrangement is a cover 6 which prevents the light of the flight lighting arrangement from being visible from the ground in a region laterally of around the wind power installation. That region can be defined by a cone diameter of, for example 2000 m, or more laterally of as formed on the ground around the wind power installation. (depending on the respective location), in which respect it is usually sufficient if the range within which In one embodiment, the light from the flight lighting arrangement is ~~not to~~cannot be seen is in a region of up to about 1000 m (from on the ground) besides around the wind power installation. The region around the wind power installation from which light from the flight lighting

arrangement 5 is substantially blocked may vary based upon the height of the wind power installation, the shape and size of the cover 6 and/or pod 4, and the ambient light conditions at the time of viewing. The volume from which light from the lighting arrangement may not be visible, as discussed herein, may be more

5 accurately described as a cone frustum in which the top portion of the cone is truncated (i.e., the light emitted from the flight lighting arrangement above the cover 6 is visible in the apex region of the cone and at a distance therefrom as illustrated in Figure 3b).

The shape of the region may covered surface can be predetermined

10 by a corresponding correspond to a shape of the cover 6 or pod 4. If for For example, if the cover 6 comprises a large circular disc, then the light of the flight lighting arrangement is arrangements 5 would not be visible in a conical region below the disc, and, depending Depending on the respective diameter of the disc, the covered (e.g., non-lit region) area is can be larger (increase in the cone angle,

15 as defined by an apex of the cone above the cover and illustrated in Figures 2 and 3b). If the cover 6 of the flight lighting arrangement 5 is in a parabolic cover in shape (Figure 3a) or box-shaped cover (Figure 3c), the cone angle covered can be up to 180°. A cone angle of 180° or greater may prevent the flight lighting arrangement 5 or light therefrom from being viewable from the ground. (with respect to the cone), that is to say in that case Thus, when the cone angle is less than 180°, the light from the flight lighting arrangement 5 is practically no longer visible below the horizontal slanted lines defining the sides of the cone (see Figures 2 and 3), with respect to the flight lighting arrangement 5. Such a large angle however is Large angles, as described, are usually scarcely necessary

20 unnecessary as the flight lighting arrangements 5 of the wind power installations in any case are often located at relatively high, that is to say exposed positions, and with respect to the surrounding buildings therearound are markedly below the height of the flight lighting arrangement of the wind power installation.

If therefore the ~~cover angle~~cone angle is about 160 to 170° (with respect to the cone), then the light of the flight lighting arrangement ~~5~~ is no longer ~~may not be visible~~ in a region of about 500 - 2000 m laterally of the wind power installation, but at the same time the light from the flight lighting arrangement is

5 readily visible for all ~~may be visible by~~ the flight traffic, as hitherto.

In principle, it is also possible for the cover ~~6~~ of the flight lighting arrangement ~~5~~ to be such that it is always only the same region in a given lateral region of the wind power installation that is covered. If that cover ~~6~~ is stationary or can be adjusted by motor means (upon rotation of the pod about the point of

10 rotation), therefore, ~~it is always in such an embodiment, only the same selected~~ region laterally of the wind power installation that is covered, independently of the ~~an~~ azimuth angle of the wind power installation. As Figures 3a - 3d show, various ~~variations in respect configurations~~ of the cover ~~6~~ can be envisaged. In that respect it is the position of the outer edge 7 of the cover ~~8-6~~ that is the determining

15 aspect for ~~determines the coverage area (i.e., cone diameter)~~.

The higher ~~or more extended~~ that outer edge 7 is taken, the correspondingly greater is the ~~cover angle~~cone angle and the correspondingly greater also is the ~~distance from~~cone diameter of the region around the wind power installation, ~~within which the light from the flight lighting arrangement is no~~

20 longer visible.

~~As the disturbing influence~~ The intensity of the light from the flight lighting arrangement however decreases with the distance ~~in relation to~~from the wind power installation, ~~it would usually be thus it may be~~ sufficient if the cover provides a 'shadow range' ~~which is of about~~ 1500 to 3000 m, or markedly less,

25 around the wind power installation.

All of the above U.S. patents, U.S. patent application publications, U.S. patent applications, foreign patents, foreign patent applications and non-patent publications referred to in this specification and/or listed in the Application Data Sheet, are incorporated herein by reference, in their entirety.

From the foregoing it will be appreciated that, although specific embodiments of the invention have been described herein for purposes of illustration, various modifications may be made without deviating from the spirit and scope of the invention. Accordingly, the invention is not limited except as by

5 the appended claims.

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